

THE CHEMIST

September, 1958

VOLUME XXXV



NUMBER 9



Bernard E. Schaar

Receives Honorary AIC Membership

(See Page 411)



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Vol. XXXV

September, 1958

Number 9

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Deadlines for The Chemist

The deadline for the November issue of *The Chemist* is October 10th. Advertising copy for November should be received not later than October 15th.

THE AMERICAN INSTITUTE OF CHEMISTS does not necessarily endorse any of the facts or opinions advanced in articles which appear in *THE CHEMIST*.

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TO COME IN OCTOBER

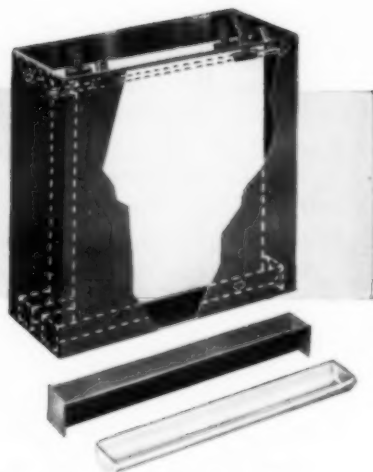
Now that Fall is here, a program of accelerated AIC activities will go into effect. Studies have been made by the National AIC Council, the Committee on Implementing AIC Objectives, and some of the Chapters, and recommendations for an intensified program are being carried out. More information will be given about this program.

- T. H. Hopper, chief of the Industrial Crops Lab., Southern Utilization Research & Development Div., USDA, New Orleans, and recipient of the Honor Scroll of the Louisiana Chapter, provides us with a paper "On Professionalization of Chemists."
- The article, "Motion Pictures as a Tool for Teaching Chemistry," by True Boardman, (postponed from September), will appear.

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*Author's article, cited above, also describes an adapter for use with paper sheets 8 \times 4 inches. Information on request.

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EDITORIAL

"The Impact of Society on Science"

THIS "inverted" title, "The Impact of Society on Science," was chosen by Prof. E. W. R. Steacie, president, National Research Council of Canada, for the title of the Purvis Memorial Lecture which he delivered to the Canadian Section of the Society of Chemical Industry in Montreal, Nov. 27, 1957. The full paper is printed in *Chemistry and Industry*, Dec. 7, 1957, but some excerpts from it are quoted here to stimulate the thinking of those who have an interest in philosophy:

... if the impact of science on society has been spectacular and both beneficial and horrible, the impact of popular ignorance on science has been equally spectacular and similarly has its horrible aspects. The growth of science and of the importance of science are major features of our day, but we are faced with many serious problems because of popular ignorance of what science is or does; secrecy, manpower, the sputnik, the distinction between science and technology, and the relation of science to the humanities are examples which all give scope for maximum misunderstanding.

The danger of the lack of understanding of the aims and methods of science have ... been widely recognized, both by scientists themselves and by a vocal group who make their living by popularizing science. The difficulty is that most of these efforts ... are irrelevant since they adopt the "ain't science wonderful" approach. A lecture ... on "New Wonderdrugs," "Marvels of Plastics," or "Chemistry in the Service of Man" may be appreciated by the audience and may give them a few disjointed facts. It makes, however, no contribution to the main problem of developing an increasing understanding of the methods, aims

and scope of science. ... many popular lectures on science lead to a complete confusion of ideas, and produce in the minds of the public the idea that science operates by producing an interminable and random succession of gadgets. This also serves to distract attention from the fact that it is essential that the leaders of our society have some appreciation of the implications and methods of science ...

Science has developed an increasing understanding of nature. As this understanding develops there is an increase in the pool of natural knowledge on which technology is based. The technological innovation that results, i.e. what is invented, is then a matter for society to decide. Far from technology forcing itself on society, it is society which ultimately controls technological innovation. A given technological innovation is therefore by no means inevitable, but it is a deliberate choice of society; whether society exercises this choice in a sensible way, is, of course, quite another matter.

The main point ... is that the argument is often made that technological advance has a great influence on society, with the tacit implication that society has little influence on the direction of technological advance. Actually the direction of technological advance is apt to be due far more to advertising and sales and promotional efforts than to the efforts of scientists and engineers. For example, it is equally possible from a technical point of view to have automobiles get longer, more ornate, higher powered and more expensive, or to have them get more durable, cheaper and more convenient. The direction of the development is decided by the public under the influence of mass media of communication. Science has the major influence on what is possible, but only a minor influence on what is in fact done.

The crux of the matter is that the development of scientific knowledge, and the potential technological ad-

vances which may arise from it, have given society the chance, for the first time, to make decisions on many matters which in the past have been largely or totally beyond its control . . .

The interlocking of science and technology has led to considerable confusion about the aims of science . . . Science is in a dual position as part of a humanistic education (after all, it is a branch of philosophy) and as the basis of technological development. One danger of the importance of science to technology is that science in its own right as a branch of knowledge is apt to be overlooked or minimized. It is, in fact, the ignoring of science in its own right which has been responsible for drumming up a purely bogus clash in outlook between the scientist and the humanist.

Scientists and engineers are now plotting to attain the moon. Should they succeed, what decisions will society make? Havelock Ellis, pessimistic about human nature, once said, "The sun and the moon and the stars would have disappeared long ago . . . had they happened to be within the reach of predatory human hands." Perhaps by the time moon travel is achieved, scientists, working as a part of society, will have increased public knowledge of the scientific method enough so that society will be able to make wiser decisions.

SPECIAL AIC ANNOUNCEMENTS

AIC Committees

To the list of AIC Committees appearing on pages 342-343 of the July issue of *THE CHEMIST*, please add:

Membership Committee

Dr. Lawrence T. Eby, Chairman
Dr. Stephen D. Bruck
Thomas H. Burns
Dr. Albert A. Dietz
Dr. A. W. Fisher, Jr.
Dr. Fred J. Gajewski
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Dr. Rudolph Seiden
Dr. Herman Wachs
Robert C. Watson
Alfred J. Webber
Dr. Austin B. Wilder

To the Public Relations Committee, please add the name of Dr. Emmett B. Carmichael.

To the Committee on Chapter Activities, please add the name of Dr. John A. Southern.

To All AIC Members

If you are in Chicago, or plan to attend the ACS convention there in September, we hope to see you at the AIC Social Hour, to be held Monday, September 8, 1958, at 5:15 p.m., in the Sheraton Room of the Sheraton-Blackstone Hotel, Chicago, Illinois.

Science Teacher Standards

The AIC, the New York Section of the American Chemical Society, and other groups protested the proposed standards of the New York State Education Department for the certification of high school teachers of science. The AIC Council went on record in favor of fewer courses in education and more emphasis on basic science and mathematics training as a more desirable background for science teachers in high school. Karl M. Herstein, F.A.I.C., who served on

AIC ANNOUNCEMENTS

both the AIC and ACS committees, reports that the Board of Regents of the State of New York has revised its proposed standards to comply with the views of the organized scientists.

Washington Chapter Officers

For the current fiscal year, the following officers are serving the Washington Chapter:

President, Dr. Carl J. Wessel,
National Research Council,
2101 Constitution Ave.,
Washington 25, D.C.

Vice President Albert F. Parks,
Bureau of Customs,
Internal Revenue Bldg.,
Washington 25, D.C.

Secretary, Prof. Madeline M. Henderson,
662 Plater St.,
Aberdeen, Maryland.

Treasurer, Dr. Alexander P. Mathers,
Alcohol & Tobacco Tax Lab.,
ATTD, Treasury Department,
Washington, D.C.

National Council Representative,
Dr. Carl J. Wessel.

Annual Meetings Ahead

The 36th Annual AIC Meeting will be held at the Traymore Hotel, Atlantic City, N. J., May 6-8, 1959, with the New York and New Jersey Chapters acting as hosts.

The 37th Annual Meeting will be held in Minneapolis, Minn., in May, 1960, with the Twin City Chapter as our host.

The 38th Annual Meeting will be held in Washington, D. C., in May, 1961, where our host will be the Washington Chapter.

Theme for the Year

The New York Chapter has chosen a general theme, "Achieving Professional Success—a Do-it-Yourself Project," around which its program of meetings for the current year is oriented. The complete schedule of meetings, and the topics for discussion, are listed on page 408. Much credit for arranging this program of meetings goes to George F. Foy of the Fine Chemicals Division, Shulton, Inc., Clifton, N. J.; Robert K. Neuman of the ACS News Service, New York 16, N. Y., and Robert R. Dean, Westvaco Chlor-Alkali Div., Food Machinery & Chemical Corp., New York 17, N. Y.

Representatives to the AAAS

The AIC representatives to the Council of the American Association for the Advancement of Science, for the current fiscal year, are Dr. Wayne E. Kuhn, AIC president-elect and Dr. Lloyd Van Doren, AIC secretary. Alternate representatives, continued from the preceding year, are O. B. J. Fraser, F.A.I.C., and John H. Nair, F.A.I.C.

Will You Come

Sept. 20, 1958. Alabama Chapter. Boat trip up Black Warrior River. 4:30 p.m. from Gulf State Paper Corp. Boat Dock, Tuscaloosa, Ala. Supper provided on board. Wives and guests welcome. For details: Dr. C. E. Feazel, 827 Sims Ave., Crestline Heights, Birmingham 9, Ala.; M. B. Williams, 402 E. Holmes St., Huntsville, Ala.; John M. Jernigan,

Southern Pine Chemicals, Inc., 2503 Greensboro Ave., Tuscaloosa, Ala., or Dr. K. E. Jackson, 105 Frederick Court, Tuscaloosa, Ala.

Sept. 25, 1958. New York Chapter Meeting. Bogert Room, The Chemists' Club, 52 E. 41st St., New York, N. Y. Social Hour 5:30 p.m. Dinner 6:30 p.m. Address 7:30 p.m. Speaker: James Crowe, executive editor, ACS Applied Journals. Subject: "The Best Job for You—a Survey of Opportunities for the Aggressive of all Ages." (Positions discussed: Teaching, Research, Process Development, Production, Quality Control, Sales, Technical Service, Market Research, Product Research, Sales Development, Legal Administrative) Reservations (Dinner \$4.90. No charge for those attending address only), Robert R. Dean, Westvaco Chlor-Alkali Div., 161 E. 42nd St., New York 17, N. Y. (MU 7-7400).

Oct. 14, 1958. AIC Board of Directors and Council. Dinner and meeting. Board meets at 5:30 p.m., Council at 6:00 p.m. The Chemists' Club, 52 E. 41st St., New York 17, N. Y.

Oct. 20, 1958. New Jersey Chapter. Dinner 6:00 p.m., The Chatham, Summit, N. J. Meeting jointly with Lackawanna Sub-Section, of the North Jersey Section, American Chemical Society, at the Celanese Corp. of America, Summit, N. J., at 8:00 p.m. Subject, "How Professional Societies Affect the Life of the Chemist." Speakers include Dr. Henry B. Hass, recent AIC president, and president of the Sugar Research Foundation, New York, N. Y., and Dr. Bradford R. Stanerson, director, National ACS Membership Affairs. All interested are invited. For reservations and details: Dr. J. F. Mahoney, Merck & Co., Inc., Rahway, N. J. (FU 8-1200, Ext. 3254).

Nov. 20, 1958. New York Chapter Meeting. Bogert Room, The Chemists' Club, 52 E. 41st St., New York, N. Y. Social Hour 5:30 p.m. Dinner 6:30 p.m. Address 7:30 p.m. Speaker: Marlin G. Geiger, executive vice president, W. R. Grace & Co. Subject: "Achieving Success on the Job—Exploiting our Abilities." (To be discussed: Learning our technical and personality traits. Fitting them to the job. What is expected of the chemist in research, marketing, etc.

Working with superiors . . . equals . . . subordinates. Professional attitudes) Reservations (Dinner \$4.90. No charge for those attending address only), Robert R. Dean, Westvaco Chlor-Alkali Div., 161 E. 42nd St., New York 17, N. Y. (MU 7-7400).

Jan. 8, 1959. New York Chapter. Honorary Membership Meeting. Hotel Shelburne, 37th St. and Lexington Ave., New York, N. Y. Social Hour 5:30 p.m. Dinner 6:30 p.m. Program 7:30 p.m. Honorary Membership Recipient, Dr. Foster D. Snell, president, Foster D. Snell, Inc., New York, N. Y. Speaking for Dr. Snell as a person: Dr. Donald B. Keyes. Speaking for Dr. Snell as a chemist: Cyril S. Kimball, executive vice president, Foster D. Snell, Inc. Presentation of Honorary Membership: Dr. Emil Ott, AIC president. Acceptance Address: "The Independent Consultant and Independent Laboratory as a Professional Activity." Reservations (Dinner \$6.25 in advance; \$7.00 at the door), Robert R. Dean, Westvaco Chlor-Alkali Div., 161 E. 42nd St., New York 17, N. Y. (MU 7-7400).

Feb. 6, 1959. New York Chapter. Joint meeting with New York Section of the American Chemical Society. Place and time to be announced. Speaker, Wallace R. Brode, scientific advisor to the Department of State. Subject: "Government Policy. Why the Chemist Should Contribute." (To be discussed: Professional responsibility of the chemist. Need for the scientific approach. How he can contribute to local, state, and federal policy. Benefits to the chemist . . . to commerce . . . to society.)

Apr. 16, 1959. New York Chapter Meeting. Bogert Room, The Chemists' Club, 52 E. 41st St., New York, N. Y. Social Hour 5:30 p.m. Dinner 6:30 p.m. Address 7:30 p.m. Speaker: Earl Ubell, Science editor, *New York Herald Tribune*. Subject: "Community Recognition—How the Chemist Can Achieve It." (To be discussed: Professional responsibility of the successful chemist. Public relations techniques for obtaining recognition. Working with editors . . . with others who contribute to the chemist's recognition. Benefits to the chemist . . . to the profession . . . to society) Reservations (Dinner \$4.90. No charge to

WILL YOU COME

those attending address only), Robert R. Dean, Westvaco Chlor-Alkali Div., 161 E. 42nd St., New York 17, N.Y. (MU 7-7400).

May 28, 1959. New York Chapter. Honor Scroll Award Meeting. Hotel Shelburne, 37th St. and Lexington Ave., New York, N. Y. Social Hour 5:30 p.m. Dinner 6:30 p.m. Program 7:30 p.m. Award recipient and speakers to be announced.

Dr. Detlev W. Bronk, president, National Academy of Sciences-National Research Council, announces the formation of a 15-man Space Science Board "to survey in concert the scientific problems, opportunities and implications of man's advance into space."

Papers are invited on all phases of Analytical Chemistry and Instrumental Analysis for the Tenth Pittsburgh Conference on Analytical Chemistry & Applied Spectroscopy to be held at the Penn-Sheraton Hotel, Pittsburgh, Pa., March 2-6, 1959. Send inquiries to Dr. Fitz Will, III, Program Chairman, The Pittsburgh Conference, Alcoa Research Labs., New Kensington, Pa.

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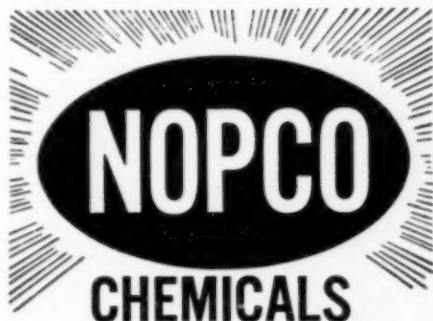
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About AIC Members

Dr. Roger W. Truesdail, F.A.I.C., president of Truesdail Labs., Inc., Los Angeles 65, Calif., announces that a new branch laboratory was opened, August first, at 712 Tuna St., Terminal Island, Calif., to serve the fishing industry.

Dr. Walter J. Murphy, Hon. AIC, editorial director of the ACS Applied Publications, was presented with a scroll and cited for "his genius as an editor and his alertness to the constantly growing and changing information needs of chemical engineers, chemists and executives," by the American Section of the Societe de Chimie Industrielle, at its 40th Anniversary meeting. **James M. Crowe**, F.A.I.C., executive editor of the ACS Applied Journals, was also awarded a scroll for his technical skill and for his development of many useful editorial features.

Peter Vaterrodt, F.A.I.C., retired, has gone to Europe for an extended stay of from two to three years.

The University of Akron, Ohio, will celebrate, Oct. 3, its fiftieth anniversary of the teaching of rubber chemistry at the university and will establish a Rubber Science Hall of Fame on the Akron campus. **Dr. Peter Debye**, F.A.I.C., Nobel laureate, and professor emeritus of Cornell University, will participate in the symposium, "Macromolecules and Elastic Networks." **Dr. Thomas Sumner**, F.A.I.C., head of the Chemistry Department of the University of Akron, will speak on "The History of Rubber Chemistry at the University of Akron." Among the alumni now associated with the rubber industry, are **Dr. Howard I. Cramer**, F. A. I. C., **Dr. Otis D. Cole**, F. A. I. C., and **Dr. James D. D'Ianni**, F.A.I.C.

Dr. Hans O. Kauffmann, F.A.I.C., has been transferred from Becco Chemical Division, Buffalo, N. Y., to Food Machinery & Chemical Corp., P.O. Box No. 8, Princeton, N. J.

(See pages 430-432)



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Serendipity—A Comedy of Errors

Bernard E. Schaar, Hon. AIC

*Chairman of the Board, Schaar & Co., 7300 W. Montrose Ave.,
Chicago 34, Ill.*

(Presented when the author received Honorary AIC Membership at a meeting of the Chicago AIC Chapter, March 27, 1958, in Chicago, Ill.)

WHAT I have learned about serendipity, I hope will serve to lessen its use to designate some discoveries by scientists that have resulted from recognizing the importance of unplanned events that occurred in the course of their research.

Serendipity was invented in 1754 by Horace (Horatio) Walpole, English peer, (1717-1797), historian and voluminous letter writer, on his assumption that it described the experiences of three princes in a Persian fairy tale. Then when the lexicographers ran across it, they embellished its meaning. Within the past few years, scientists discovered the word and have had a Roman holiday applying it to various scientific discoveries with which it did not have the most remote connection.

According to the *Oxford English Dictionary* (1933 edition), Walpole wrote his friend Horace Mann (1701-1786), that "he had formed the word 'serendipity' upon the title of the fairy tale, 'The Three Princes of Serendip,' the heroes of which 'were always making discoveries by accident or sagacity, of things they were not in quest of.'" *Oxford*, on its own responsibility, adds this further definition, "also, the faculty of making happy and unexpected discoveries by accident."

Since that definition did not seem to warrant its use to describe accidental scientific discoveries, I sought more information. I was quite 'surprised', as Priestley so frequently was in writing about his discoveries, that a hornet's nest of errors would be uncovered.

In his letter to Mann, Walpole not only left off half the title of the book and misspelled the name of the princes' country, but indicated complete misinterpretation of the princes' experiences.

The full title of the fairy tale, on the title page, is

*The Travels and Adventures of
Three Princes of Sarendip. Intermixed
with Eight Delightful and Entertaining
Novels. Translated from the Persian
into French and from thence
done into English.*

London MDCCXXII.

The tale starts this way:

"In those happy times when Kings were Philosophers, and sent each other important questions to be resolved; there was in the East a powerful Monarch named Faer who reigned in the Kingdom of Sarendip. This Prince had three male children, equally handsome, well made, and very promising. As he loved them with Extreme Tenderness, he was willing to have them instructed in the necessary Sciences to the end that they might be worthy to succeed him in his *Dominions* . . . The three young Princes, who were very ingenious, and had as much desire to learn as their Masters had to teach them, soon became very

knowing in *Morality, Politicks, and all polite Learning* in general."

When their father thought the Princes' education was finished, he commanded them in turn to appear before him. The monarch offered each his throne, saying that he was unable to rule longer because of age and infirmity. Each prince independently rejected the offer, praising the father for his wisdom and successful regime.

That was precisely what Faer wanted. In feigned anger at his sons' disobedience, he ordered their banishment, knowing that the experience gained from travel abroad would be most valuable to them. They were escorted to the border of the realm, and from there on, the "happy and unexpected discoveries by accident," to quote *Oxford*, were made.

In the neighboring land, they met a cameleer who inquired if they had seen a strayed camel from his caravan. The princes asked if it was blind in one eye, lame in one leg, and was carrying a pregnant woman. When the cameleer confirmed every detail and asked where his camel was, they startled him by saying they had never seen it. He then accused them of stealing it and had them brought before the ruler for trial. When they revealed that they had arrived at the camel's description by a series of clever deductions from the way the cians, made them his honored guests.

After they had uncovered a plot to poison the ruler, he implored them to

grass had been cropped on one side of the path, and other subtle signs, the ruler, believing them to be magi-recover his magic mirror from the queen of a neighboring country, who had gained possession of it. When they attempted to do this, they were arrested by the queen who sentenced them to death. She commuted the sentence when they solved some silly conundrums and performed a few "miracles." She eventually gave them the mirror and freed them after offering to marry the oldest, if he could secure his parental blessing.

On the homeward journey, they found the ruler whose guest they had been, despondent and on the verge of collapse. He had sent his favorite slave, Dilirem, into the forest, stripped naked, for having excelled him in archery. When he relented and sent for her, she could not be found and he thought the wild animals had devoured her. Dilirem, however, had eluded the animals and had joined a travelling band of merchants. Thereupon our heroes became physicians, but their prescription for the monarch's cure was more indicative of youthful desires than of medical knowledge. They advised him to erect seven palaces in beautiful places, overlooking magnificent views. In each, there should be established a beautiful princess and a novelist. The monarch should spend one night in each palace, where after the tender ministrations of the princess, the novelist should

lull him to sleep by reciting a novel. After the seventh night, the monarch was cured. So the princes were then permitted to return to their own country. The oldest eventually married the queen in traditional fairy tale ending.

In brief, that is the basis for Walpole's coinage of "serendipity." The book is a silly fairy tale, ribald, cruel in spots, with many unexpected incidents, but none that remotely resembles a scientific discovery. (The Newberry Library in Chicago has a copy of this book in its rare book section.)

Now the lexicographers have invented their own definitions of serendipity, basing most of the material on the *Oxford* item.

Funk & Wagnall's New Standard Dictionary (1952) changes the latter part of the *Oxford* item to read, "the ability of finding valuable things unexpectedly." It also says the three princes "were continually finding valuable articles by chance." (If the book mentioned anything to that effect, I missed it entirely.) It adds the gratuitous information: "Serendip—Serendib, former name of Ceylon." There is nothing in the tale to indicate that the Persian author had Ceylon in mind when he named the princes' country "Sarendip." He may have invented the name, since Ceylon is an island and the princes travelled by land from their country into the neighboring kingdom.

Webster's New International Dictionary (1955), uses "gift" of finding instead of "faculty" or "ability."

Webster's New World Dictionary (1954), in addition to copying the data regarding Walpole's coinage of the word, gives him credit for writing the whole story. The definition is changed to read, "an apparent aptitude for making fortunate discoveries accidentally."

Walpole is not the only person credited with writing the fairy tale. Recently someone stated that "serendipity is a word coined by Thackeray from a country in a fairy tale that he wrote."

The American College Dictionary (1956) defines serendipity as "the faculty of making desirable but unsought-for discoveries by accident," and then states that the princes "looked for one thing and found another." (I was unable to find anything to that effect in the book either.)

Hack's Chemical Dictionary (1944) is a little more original. The word there becomes "serendipty" and its definition "intelligent curiosity. Ability to make unexpected discoveries."

Little and Ives Webster Dictionary (1957) gives Walpole credit for the word's coinage in "Letters" to Mann, "fr. Serendib, -dip, Arab. name of Ceylon, in tale of three princes of Ceylon." It adds, "The faculty of finding interesting and valuable things

by chance or where one least expects them."

The New Century Dictionary (1942) says it is "The faculty or habitual experience of making happy or interesting discoveries unexpectedly or by accident." It then coins another word, "Serendipper, one who has or displays the faculty of serendipity."

A composite of the various definitions of serendipity reveals that it is the faculty, ability, gift, aptitude, or habitual experience of making happy, unexpected and fortunate discoveries by accident plus a penchant for finding valuable things or articles by chance. Brains apparently are ruled out entirely.

That idea seems to be taking hold. The Sept. 28, 1957, issue of the *New Yorker* has a cartoon of a blindfolded scientist in his laboratory, taking bottles of chemicals indiscriminately from shelves and pouring them into a vessel. A visitor being shown around the laboratory is told by his guide: "That's Dr. Arnold Moore. He's conducting an experiment to test the theory that most scientific discoveries were hit on by accident."

Aside from Joseph Priestley, (1733-1804), who was always "surprised" at what he discovered "by chance," few scientists have ever had more than one such incident in their lives. Something that may happen once in a lifetime can hardly be said to be a "faculty," "ability," "gift" or "apti-

tude." Priestley's "surprise" at his "chance" discoveries was occasioned by his observation of many unexpected results encountered during his experiments, but he was experimenting, not just waiting for something to happen.

A few examples of accidental scientific discoveries will serve to show the difference between them and serendipity, either as the word was used by Walpole or as defined in the dictionaries.

Leo H. Baekeland (1863-1944), after selling his Velox paper to Eastman for a fabulous sum, set out to make something entirely different from the product he eventually succeeded in making. The violent reactions between phenol and formaldehyde, some altogether unexpected, had stumped many investigators, but they intrigued Baekeland. It took him many years of patient research to discover that those reactions could be controlled to produce Bakelite, which turned out to be far more valuable than the shellac he started out to make. Bakelite was not handed to him on a silver platter, ready to market, as it would have been had it been a case of serendipity.

Louis Pasteur (1822-1895), in relation to proof of his idea that hemihedry (half-sided crystals) was interrelated to molecular rotatory power of natural organic compounds, said, "I was soon enabled to establish it clearly by a wholly unexpected discovery." He, himself, did not know

then how chance had made his discovery possible. Pasteur's crystals of the sodium ammonium salt of paratartaric acid (racemic acid) had crystallized below 27°C . There was no reason why he should have selected that temperature—it just happened to be below 27° . He expected to get crystals different from those of sodium ammonium tartrate because they rotate the plane of polarized light, whereas the racemates are optically inactive. Naturally he was surprised when, instead of one kind of crystal, he got two kinds which were mirror images of each other. Those crystals that were left-handed rotated the plane of polarized light to the left, and vice versa. Equal parts of each neutralized each other, which is why racemates are inactive. What would have happened if the temperature had been above 27° ? Crystals neither left- nor right-handed would have formed because both would be in the same crystal, neutralizing each other's effect so that the plane of polarized light would not be rotated. Clearly, Pasteur's discovery must be credited to accident, but it was not serendipity.

In the nature of things chemical, it is improbable that anyone would have sought a substance sweeter than sugar outside of the class of carbohydrates to which all sugars belong. The saccharin molecule contains sulfur and bears no structural resemblance to sugar. Its sweetness was

discovered by Constantin Fahlberg (1850-1910), a student of Ira Remsen (1846-1927), working under his direction on the oxidation products of toluene sulfamides. Neither Fahlberg nor Remsen had the slightest idea that one of those products would be the sweetest substance ever known to man. One evening, while eating dinner, Fahlberg found that everything tasted excessively sweet. Subsequent testing of every substance he had worked with in the laboratory that day identified it. Fahlberg patented the product without Remsen's knowledge, formed a company to market it, and never even mentioned Remsen as having had anything to do with its discovery. The difference between this discovery and serendipity is obvious.

Aspirin (acetyl salicylic acid) long known as a chemical but not used as a pain killer, was recommended one day to ease the pain of an arthritic patient after other salicylates had failed to benefit him. It seemed helpful and subsequently was prescribed for other arthritic patients. Then it was discovered that whenever a patient had a headache at the time he was taking aspirin, the headache soon disappeared. That, too, was an accidental discovery. Incidental perhaps would be a better adjective, but certainly not serendipital.

Accidental scientific discoveries usually are made by experimenters seeking solutions to particular prob-

lems. An unexpected event either aids in solving their problem or suggests a new line of investigation that leads to the discovery of something of an entirely different nature.

Occasionally a combination of circumstances prepares the ground for a discovery when the discoverer had given no previous thought toward that end. The stethoscope resulted from such a situation.

Rene T. H. Laennec (1781-1826), certainly had never considered changing the then accepted method of chest examination. In 1816 it was standard practice for a physician to press his ear against his patient's chest to hear the sounds emitted by the chest organs. When a fat young woman with a heart ailment presented herself for examination, Laennec was confronted with a problem in esthetics as well as physics. Restrained by false standards of propriety and by his conviction that he could not hear any sounds from her heart through those layers of adipose tissue, his mind raced to discover some way whereby he could find out how his patient's heart was acting. He recalled a course in acoustics where sounds were transmitted through solid substances; he thought back to his youth when he talked to a playmate through a long hollow log. A quire of paper lay on his desk which attracted his attention. The thoughts coalesced. He rolled the whole quire into a cylinder. Placing one end of the cylinder to his patient's

chest and the other to his ear, he heard her heart beat. He wrote: "I was not a little surprised and pleased to find that I could thereby perceive the action of the heart in a manner much more clear and distinct than I had ever been able to do by the immediate application of the ear." Serendipity does not include accidental circumstances of this sort.

The essential truth of Pasteur's statement that "in fields of observation, chance favors only minds that are prepared," is aptly revealed in the stories of three discoveries that resulted from accidents involving collodion. When Alfred Nobel (1833-1896) cut his finger and covered it with collodion, the flexible residue of nitrocellulose remaining on his finger suggested its use as a solidifier for nitroglycerine. "Blasting gelatin" resulted from that accident. John W. Hyatt, Jr. (1837-1920), also cut a finger. When he wanted to put collodion in it, he found the bottle empty; the collodion, spilled on the shelf, had hardened into a smooth glossy layer. Hyatt proceeded from that accident to make celluloid, the first synthetic plastic. When Hilaire De Chardonnet (1839-1924), spilled a bottle of collodion, he attempted to wipe it up with a rag. Long thin strands of collodion hung between the table and the rag. That accident pointed the way to synthetic fabrics. Millions of people have covered cuts with collodion or have spilled it, but

no scientific discoveries resulted from their accidents. The difference is, as Pasteur indicated, that each of those ingenious men was prepared by previous experience to correlate his accident with something on which he had been working and to make use of it. Again it is clear that none of these discoveries can be classed as an example of serendipity.

Philipp E. A. von Lenard (1862-1947), Nobel laureate in physics, defended Hans Christian Oersted (1777-1851), against the charge that his discovery of the relationship of electricity to magnetism was accidental: "... it is a sign of widespread ignorance of the matter, when the credit due to a discoverer is regarded as diminished by his not having known beforehand what was to be found." He said that it is most insulting to the wisdom and integrity of a discoverer to say that his discovery is accidental. Yet he ends his tirade with this *non sequitur*: "Every great discoverer has been surprised by his own discovery." (Incidentally, Oersted's discovery was not accidental.)

Regardless of the type of fortuitous circumstance that results in a discovery, it would be wasted on the desert air if the discoverer did not have the necessary background of training and experience to spot the significance of the accident or its possible application to the problem. For anyone to take advantage of an occurrence of this nature and be able to see it through

to ultimate discovery of anything is quite as praiseworthy as making a discovery by deliberate, unhampered steps toward that goal.

Joel Hildebrand, Hon. AIC, in *Science in the Making* (1957), after stating that a discovery he had made was partly the result of accident, adds this comment:

"An interesting book remains to be written recounting discoveries that have turned up while the scientist was looking for something else. This process is being elevated to a recognized place in science by naming it 'serendipity' after Horace Walpole's fabulous land of Serendip, where lucky accidents are the rule. One should note, however, that one must have sharp eyes to be a successful serendipitist in the laboratory. Lucky accidents are easily overlooked, and important discoveries left to later investigators."

Hildebrand appears to have consulted the dictionary that credits Walpole with writing the fairy tale for his definition of serendipity. But he accepts it, to be sure, with a large grain of salt.

In the preface to his *Historical Background of Chemistry* (1956), Henry Leicester said:

"Historians of science now generally recognize that scientific discoveries, great or small, are almost never spontaneous and original contributions of one man."

Newton was clear in acknowledging his debt to predecessors when he said that he was able to see farther because he stood on their shoulders.

When a scientist seizes on some accidental event in the course of his research and develops it into a scientific discovery, his ability to do this is



Dr. Henry B. Hass, recent AIC president, and president of the Sugar Research Foundation, New York, N. Y., presents Bernard E. Schaar, with the certificate of Honorary AIC Membership.

The meeting, sponsored by the Chicago AIC Chapter, was held in the Beaubien Room, Prudential Building, Chicago, March 27, preceded by a reception through the courtesy of Schaar & Co. Dr. Harold M. Coleman, of General American Transportation Corp., chairman of the Chapter, presided. The citation to Mr. Schaar reads:

Chemical manufacturer, civic leader and humanist, who has given unselfishly of his time and energy to promote his profession, the interests of his fellow chemists, and the welfare of his community.

dependent, not only on his knowledge of what prior workers in that field have done, but on his own experience as well. Serendipity presupposes nothing. Things just happen. Discoveries are made without thought, preparation, or knowledge—and brains are ruled out entirely. It completely eliminates the discoverer's knowledge, ability and acuity, and ascribes his discovery altogether to chance. To that extent, the use of serendipity to describe some scientific discoveries lowers the professional status of all

scientists.

At this particular time in world history, when ordinary words frequently are distorted out of all semblance to their generally accepted meanings, it is important for scientists to be specially careful in their choice of words to describe their work.

Serendipity, from its erroneous conception by Walpole, to the inspired meanings invented by lexicographers, does not have a leg to stand on as a substitute for the phrase "accidental scientific discovery."

The Scientific Manpower Problem

Dr. Otto Eisenschiml, F.A.I.C.

Chairman of the Board, Scientific Oil Compounding Co., Inc.,
1637 S. Kilbourn Ave., Chicago 23, Ill.

(Excerpt of an address delivered, March 6, before a joint meeting of the Twin City Chapter of the AIC, the Twin City section of the American Chemical Society, the American Institute of Chemical Engineers, and the Industrial Chemists' Forum.)

THE impression seems to prevail that the scientific manpower problem begins and ends with education, because so far it has been discussed almost exclusively by educators. I suggest that educators are not the only ones who should plan the over-all program to match or over-match Russian brain power, because education is only the first chapter of the story.

Here is the crux of the problem as I see it: *Attract enough of our brightest youngsters to take up subjects pertaining to our national survival, and have them stick to their professions after graduation. To attract and hold the youngsters, survival professions must be made more attractive than others. It's as simple as that. To herd young people into a scientific corral, hoping that they won't quit after the first enthusiasm has worn off, is all that the educators are now planning, because it is all that schools can do. I am only going to speak about chemists, but what I am going to say pertains to other survival careers as well.*

How shall we select the right candidates? The educators recommend aptitude tests. Not enough. What we need first of all are inventive, creative

chemists, and for these we now have talent-search contests, which serve the purpose well. We also need non-creative chemists, who must possess a high degree of intelligence, but not inborn gifts like creative scientists, composers and poets. Thousands of bright youngsters could make equally good chemists, lawyers, physicians, and what not. To repeat: How to attract them to survival-careers is the problem. What have we to offer them?

Well, what do our brightest youngsters want from life? After speaking (in the absence of faculty members) to thousands of high school students in every state of the Union, I believe these to be their goals, in the following order of importance:

- (1) A comfortable income, with a chance for wealth.
- (2) Recognition by their fellow citizens, with a chance for fame.
- (3) A fair degree of old-age and job security.

Income

Let's first look at the income aspect. According to a report of the National Science Foundation, released Dec. 31, 1957, railroad engineers in 1951 made 20% more money than scientists or

industrial engineers with a bachelor degree. Net incomes of physicians averaged $2\frac{1}{2}$ times scientific and engineering bachelor salaries, and $1\frac{3}{4}$ times those of scientists with a Ph.D. degree. (No special mention was made of chemists, but it is assumed that they are included in these categories.) Dentists made 44%, lawyers 65% more than science bachelors and 16% more than science Ph.D.'s. In 1954-55, carpenters, painters, plasterers, etc., who worked 50 weeks a year, made, without overtime, about \$7,500. This compares with \$7,275 for physicists and \$6,300 for mathematicians. A restaurant manager made about \$7,500 and, according to another survey, salesmen with ten years experience average \$11,000.

Considering the cost of college attendance, plus the income which has to be foregone during those years, plus the discrepancies in the incomes just cited, what can we offer to make survival careers financially attractive to smart youngsters? Nothing.

Fame

Now as to recognition or fame. Ask ten educated people of your acquaintance to name three living chemists and their accomplishments; ask them what part chemists have played and still play in our nuclear plans and achievements, and who they are. Ask them how many statues of chemists they have seen in America. Ask them the names of the great chemists to whom we owe aspirin, vi-

tamins, chloroform, nylon, high-octane gas. Ask them the names of any street, park, school or public building in their city named after a chemist. Show your findings to your own youngster, then let him decide on the desirability of becoming a chemist, so far as recognition or fame is concerned.

Security

Next, security. Of course, there is no such thing as absolute security for any trade or profession, but if there is such a thing as negative security, the chemists have it. Why? Because many industrial concerns do not hire new applicants after the age of 40, just when they, like the other learned professions, reach the maximum of their mental capacity, and should reach the maximum of their earning power. For this practice industry has reasons which it considers valid, and with which I am not quarreling; I simply am stating a fact. If your youngster knew this, would he not rather become a physician, minister, business man, lawyer, salesman or a member of any profession which has no age limit?

Perhaps you may also tell him that if he becomes a banker, salesman or plasterer, his leisure hours will be his own. A chemist, on the other hand, has to use a large part of his free time to keep up with his profession. He must run a life-long rat-race just to stand still, and run at top speed if he wants to get near the head of the

procession. Further: If a banker or a necktie salesman should be out of circulation a couple of years for one reason or the other, he can go back and become up-to-date again in no time. A chemist, under the same condition, may be completely outdated, and must make Herculean efforts to climb back on the band wagon.

What Can Be Done?

Fortunately, we can count on a nucleus of youngsters who will choose survival careers in spite of all drawbacks, just as some of them will become surgeons, ministers, etc., come hell or high water. But to make survival careers attractive for more than a small number, the drawbacks must be overcome. By scholarships? Scholarships are not the answer. They ease the way into a profession, but do not make it desirable; and if it is not desirable, people will soon leave it for greener pastures. On the other hand, if the profession is desirable, there is no need for scholarships. When a new gold-field is discovered, people will flock there, and no one needs to pay their carfare. Make survival careers as attractive as a gold-field, figuratively speaking, and most students will find a way to go through college without a scholarship.

What can we do to improve the three essential factors I have mentioned: Income, recognition and security?

About the income of industrial chemists nothing can be done, and

nothing should be attempted. Income depends on the law of supply and demand, which is stronger than all man-made statutes, rulings or intentions, and is regulated by competitive pressure. The government, however, is free from this restraint, and should pay the highest grade creative scientists amounts far in excess of the present ones, and as much as their contribution to our survival is worth in dollars and cents—if it can be so figured. The men so favored are few, and the expense would be trivial. But the high figures would give our ambitious youth something to dream about. And don't believe that all scientists are indifferent to money; even if they are, I have noticed that their wives are not.

There is a red light in front of us, to which I wish to call attention. If we, with the best intentions, stimulate the supply of chemists beyond the demand through too generous scholarships, one-sided propaganda, or other means, what is going to happen? Salaries will go down, and the best men will quit, leaving the mediocrities to carry on. I have read nothing about

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an awareness of this danger in the speeches of educators, nor of those who propose a flood of scholarships.

How about better recognition? This is a matter of intelligent publicity, and if ours has been poor so far, we chemists ourselves are largely to blame. We always talk about chemistry, hardly ever about chemists, so that the average layman has no concrete idea what chemists do. This synthetic mystery hurts our survival program by perpetuating the much talked about egg-head myth. As a remedy, I suggest a truthful but picturesque presentation of chemists and their activities through speakers and radio or TV-shows. We have mighty good stories to tell, and don't tell them. But they must be built around individual chemists and their achievements. People can only get enthusiastic about other people, not about abstract terms. The audience coming out of a movie does not talk about the moving picture industry; it talks about Clark Gable and Irene Dunne, or the like. How about publicizing our own Gables and Dunes by showing both their difficulties and their gratifications in solving chemical problems; in other words, by giving the public chemical detective stories? If we ever do, watch the understanding of and respect for our profession grow like Jack's bean stalk.

Now as to old-age security, that is, if you call 40 years old age. Well, why should chemists be given more

security than others, who are up against the same age limit? For the simple reason that we need chemists for our survival. When we needed uranium, we guaranteed all those willing to mine it a fair profit for a number of years, even after their product may no longer be wanted. Why not do the same for chemists? I suggest that we absorb those chemists who are competent, but cannot find a position on account of over-age, into the army as part of a scientific reserve. We keep officers of the army idle, just in case, why not chemists? Unlike army officers in peace time, however, chemists could be usefully employed, no matter what work they may have assigned to them. The expense would be comparatively small, considering that their achievements may also help to defray their salaries, something army officers cannot do.

To summarize: Unless we hold out to our brightest youngsters prospects of a good income, an honorable recognition, and a fair degree of old-age security, or perhaps even only two of the three, all other means of luring them into survival professions are half-measures which eventually will fall short of their purpose.

The American Association of Textile Chemists and Colorists is holding its 37th Annual National Convention Oct. 30-Nov. 1, at the Conrad Hilton Hotel, Chicago, Ill.



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Highlights of the June Meeting

The 322 meeting of the National AIC Council was held June 4, 1958, at noon at The Chemists' Club, New York, N. Y., with President Emil Ott presiding.

The following officers, councilors, or alternates, were present: J. H. Bruun, D. M. Gans, L. A. Hall, H. B. Hass, K. M. Herstein, F. A. Hessel, D. B. Keyes, W. E. Kuhn, J. H. Nair, E. Ott, H. Robinette, Jr., B. E. Schaar, W. R. Sullivan,

L. Van Doren, A. H. Warth, and M. B. Williams. Dr. Max Bender and Vera Kimball were present.

Dr. Ott stated that the Annual Meeting was an enjoyable affair with a relaxed, happy atmosphere, excellent press coverage, and top-notch speakers, but that the attendance, while not below average, did not reach the number which such a meeting merits. During discussion, it was suggested that we try to contact employers to show them the value of such meetings to their scientific personnel. Tele-

phone committees to remind local members to attend Annual Meetings were also suggested.

Dr. Ott reported that the AIC Social Hour in San Francisco was most successful with about 100 people present.

Dr. Ott presented a letter from Dr. C. F. Rassweiler, president of the American Chemical Society, thanking the AIC for its resolution of support for a new headquarters building for the ACS. (See page 341, July CHEMIST.)

The Treasurer presented the annual reports on financial affairs with the statement that these had been approved by the Board of Directors.

Dr. Sullivan asked to have the possibility of increasing Chapter rebates explored.

The subject of increased advertising in THE CHEMIST to compensate for an increase in printing costs was discussed, and Dr. Kuhn was appointed chairman of a special committee, with Dr. Keyes and Mr. Schaar as members, to consider the subject.

The budget for the 1958-1959 fiscal year was approved.

The Secretary reported with deep regret the deaths of the following members:

Dr. Edward Bartow,
F.A.I.C., on April 12, 1958.

Dr. Kenneth R. Brown,
Emeritus F., on March 18, 1958.

Dr. Joseph Dalla Valle,
F.A.I.C., on June 1, 1958.

Leonard F. Hatfield,
F.A.I.C., on Nov. 30, 1958.

Dr. Vladimir A. Kalichevsky,
F.A.I.C., on Feb. 4, 1958.

Leon Sternberg,
M.A.I.C., on Feb. 20, 1958.

The Secretary reported the present active membership as 2823.

The Secretary was requested to arrange for an AIC Social Hour to be held September 8th at the Sheraton-Blackstone Hotel, Chicago, Ill., at the beginning of the American Chemical Society convention in Chicago.

Dr. Ott announced that the committees for 1958-1959 had been appointed. (See page 342, July CHEMIST.)

Dr. Sullivan announced that the next meeting of the New Jersey Chapter will be held October 20th.

Dr. Warth reported that the Baltimore Chapter normally meets four times a year, at the Hopkins Apartments.

Dr. Gans reported on the Annual Meeting of the Ohio Chapter. Dr. Joseph H. Koffolt, chairman and professor of chemical engineering, Ohio State University, is the new chairman. The Chapter has decided to split

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into three sections, and to hold section meetings for the convenience of members. The Chapter is much interested in education and plans to work with local educators to improve science training. It will also work to influence employers to treat chemists and chemical engineers as professional men.

Mr. Williams reported that student medals of the Alabama Chapter would be awarded at a June meeting.

Mr. Robinette stated that the Pennsylvania Chapter completed its year with the Student Awards meeting in May, attended by 75 members and guests, and that while he was one of the judges of a Science Fair at Scranton University, he was approached by those interested in forming an AIC Chapter in Northeast Pennsylvania.

Dr. Hall reported that student medals were presented by the Chicago Chapter in May, with an attendance of about 120 at the meeting, and that he had spoken recently on "Scientific Education," before a group which included a number of high school science directors.

Dr. Gans asked if there was a mechanism by which the equivalent of student medals could be awarded to outstanding high school teachers of science. He was informed that the New Jersey Chapter had created a "Certificate of Merit" for an outstanding teacher in that area.

Dr. Hall presented the report of

the Committee to Implement AIC Objectives and read a letter of comment from Dr. Bender. President Ott was asked to refer each section of the report to the appropriate committee for study and report, at least two weeks before the next Council meeting.

Dr. Hass announced that AIC members in Georgia wish to form a Chapter there. The late Dr. Dalla Valle, F.A.I.C., had been organizing this potential Chapter at the time of his death. Angus J. Shingler is now serving as temporary chairman of the group.

The following persons were given Emeritus Membership:

Herman E. Bakken
Dr. George A. Bole
Dr. Ray Q. Brewster
Dr. Sidney M. Cadwell
William Callan
A. Lincoln Konwiser
James J. Lichtin
James Ogilvie
Nathan Smith

The Ohio Chapter Report on its Survey of Membership Attitudes was received with thanks and referred to interested committees.

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The following new members were elected:

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- Barnes, Dr. Carl E.**
*Director, Central Research,
Minnesota Mining & Mfg. Co.,
2301 Hudson Road, St. Paul 6, Minn.*
- Bayern, Gerald J.**
*Manager, Market Research,
Grace Research & Development Co.,
Div. of W. R. Grace & Co.,
3 Hanover Square, New York 4, N.Y.*
- Carver, Dr. Michael J.**
*Assistant Professor of Biochemistry
and Head of Neurochemistry,
Nebraska Psychiatric Institute,
University of Nebraska, College of
Medicine, Omaha, Neb.*
- Greenblatt, Dr. Irving J.**
*Director of Clinical Lab and Research
Lab., Beth-El Hospital, Linden Blvd.
and Rockaway Parkway,
Brooklyn 12, N. Y.*
- Hart, Dr. William J.**
*Technical Director,
Barbizon Corporation,
475 Fifth Ave., New York, N.Y.*
- Hatch, Dr. Lewis F.**
*Professor of Chemistry,
Dept. of Chemistry, University of Texas,
Austin 12, Texas.*
- Haymaker, Dr. Clifford R.**
*Associate Professor of Chemistry,
Marquette University,
1217 W. Wisconsin Ave.,
Milwaukee 3, Wis.*
- Heinemann, Dr. Heinz**
*Assistant to Vice President, Research
and Assoc. Director of Research,
The M. W. Kellogg Company,
711 Third Ave., New York 17, N.Y.*
- Herrick, Dr. Clifford E., Jr.**
*Head, Research Dept., Ozalid,
Division of General Aniline
and Film Corp., Johnson City, N.Y.*
- Hudgin, Dr. Donald E.**
*Head, Polymer Research Section,
Celanese Corp. of America,
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- Hunt, Dr. Madison**
*Laboratory Director,
E. I. duPont de Nemours & Co.,
Elastomer Chemicals Dept.,
P.O. Box 1407, Wilmington, Del.*
- Iannicelli, Dr. Joseph**
*Research Chemist,
E. I. duPont de Nemours & Company,
Wilmington, Del.*
- Knill, Robert B.**
*Manager of Compound Development
Tire Division, The Goodyear Tire
& Rubber Co., 1144 East Market St.,
Akron 16, Ohio.*
- Kravitz, Dr. Edward**
*Assistant Chief,
Public Health Laboratory,
City of Philadelphia, Philadelphia, Pa.*
- Luthy, Dr. Max**
*Vice-President, charge of Production
and Research, The Givaudan Corp.,
Delawanna, N. J.*
- Maisel, Dr. Daniel S.**
*Assistant Director, Chem. Dev. Div.,
Esso Research & Engineering Co.,
P.O. Box 215, Linden, N.J.*
- Nicol, Sheldon C.**
*Chief Chemist,
Goodyear Tire & Rubber Co.,
1144 E. Market St., Akron 16, Ohio.*

COUNCIL

Randall, Dr. David I.
Research Coordinator,
General Aniline & Film Corp.,
435 Hudson St., New York 14, N.Y.

Riehl, Theodore A.
Manager,
Product Development Compounding,
Goodyear Tire & Rubber Co.,
1144 E. Market Street,
Akron 16, Ohio.

MEMBERS

O'Neill, Dr. John M.
1st Lt., JAGC Acting Chief,
Patents Branch, Legal Office,
U.S. Army Rocket & Guided Missile
Agency, Redstone Arsenal, Alabama.

Owens, Dr. Kenneth E.
Research Chemist,
Minnesota Mining & Mfg. Co.,
Central Research Dept.,
St. Paul 6, Minn.

ASSOCIATES

Davis, John W.
Engineer, Brown Engineering Company,
ABMA, Bldg. 4487, Redstone Arsenal,
Alabama.

Winkler, John J.
Chemist, U.S. Industrial Chemicals Co.,
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Sweet, Dr. Thomas R.
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Report of The Professional Advisory Committee of the New Jersey AIC Chapter

(Slightly Condensed)

The Professional Advisory Committee of the New Jersey Chapter met March 19, 1958, with the following persons present: Prof. J. B. Allison, Dr. D. L. Cottle, Dr. L. T. Eby, Dr. H. H. Fox, Dr. F. A. Lowenheim, Dr. W. R. Sullivan, and Dr. M. Bender, chairman. Dr. H. H. Fox of Hoffmann-La Roche, Inc., was our guest.

The report of the AIC Committee on Implementing the Objectives of the AIC (Dr. Lloyd A. Hall, chairman) was read, followed by a lively discussion.

While the AIC received a good share of criticism, this was in the sense of our desire for the INSTITUTE to fulfill its great and important task of elevating the chemist professionally. It might seem to be advantageous to combine with the ACS, considering the latter's greater membership and resources, but actually this might not be so effective. The AIC has a vastly greater freedom of action in promoting the welfare of the individual chemist and is not bound by its charter to restrict its efforts in behalf of the American chemical profession.

Three areas were discussed where the contention was that the AIC was playing an inadequate role . . . These areas are employment service, ethics, and draft deferment.

(1) *Employment Service:* The group considered it necessary for the AIC to conduct an effective and large scale employment service for chemists, not only acting as a clearing house for positions and properly filling them, but also providing active guidance for students graduating into the profession.

It was stressed that it was essential to maintain anonymity in establishing the contacts between employers and prospective employees. This is not done in the ACS clearing house. Instructors and professors should be members of the AIC and either have knowhow on employment, giving advice to students, or invite special AIC representatives for consultation. It is apparent as to the effect this would have in attracting students to the AIC. In hard economic times, the service of the

AIC in this regard would be without parallel.

(2) *Ethics:* The ethical principles upon which the AIC is founded have to be pointed much more strongly toward the relationship between the chemist and his employer . . . We are not set up to give detailed advice and assistance in case of grievances where ethical principles have been seriously violated. Little is done in instructing our young people in the ethics of the profession. The AIC could take active leadership in this area. There should be lectures at the university level on this subject, either by informed faculty members or by AIC guests. It is desirable for the young people to have confidence in the AIC as being able to apply reasoning based on ethics to settle grievances.

(3) *Draft Deferment:* This subject is well talked about in general but the AIC, on a national level, could well do more effective work against the drafting of scientists. Many science teachers have been drafted. The ACS, which is not as well oriented toward the professional status of chemists as the AIC, has at a recent national meeting, taken cognizance of this situation and made steps to study the matter on a national level. The faculties of educational institutions could be a strong factor in the success of the AIC.

The AIC does have much rougher sledding than certain other associations because it is organized purely for the professional aspects of the chemist. The American Medical Society, the New York Academy of Sciences, the ACS, had advantages to start by acting as meeting places for exchange of technical information, this also often resulting in industrial financial support; the activity then leading naturally into professional philosophy. The AIC starts from scratch with no outside support (but with the valuable asset of complete freedom of action) so that money is required. Reference to financial needs both on the Chapter level and the national level were made; and to the paradox in the fact that only 8% of our dues go to the local chapters, who have

been expected to produce 95% of the effective work of the AIC. If hard times came, problems would be more acute.

The American Association of University Professors was suggested as an association which we might study in improving the functions of the AIC. About 50% of the professors belong to it. In dealing with grievances, this group sets proper committees for representing a professor, to work for satisfactory relationships. It rates universities and sets standards of professional behavior. Outside people are often called upon by the A.A.U.P. for help in the solution of their professional problems and this association has achieved appreciable respect over the years.

It was suggested that the AIC Committee for Implementing the Objectives of the AIC study the A.A.U.P., looking for ideas. We do not have to copy them but should benefit from this study and conceivably improve on the A.A.U.P. in given aspects. This could lead to greater and more active AIC membership, probably requiring permanent staff.

In discussing the subject of active membership, it was brought out that when a professor in the A.A.U.P. gets into university administration, i.e., becomes dean, he does not drop out, but assumes an inactive status such as association member. What would constitute inactive status in the AIC? The division between professor and administrator apparently seems to be much more sharp than that between chemist and manager. Where to draw the line would have to be worked out, but it was agreeable to give special positions of honor to those chemists so well advanced into management that they could no longer be considered as actively engaged in the science of chemistry (theoretical and/or applied).

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We hope that this report of our discussion will be helpful in strengthening the AIC. It is appreciated that a great deal depends on the individual Chapters in carrying out the activities of our association. However, much has to be done, also, on a national basis.

Maj. Gen. William M. Creasy, retiring as chief chemical officer of the U. S. Army, Sept. 1, will join The Lummus Co., 385 Madison Ave., New York, N. Y., as vice president and director of the Engineering Development Center.

American Viscose Corp., Philadelphia 3, Pa., plans to discontinue operations at its plant in Roanoke, Va. Plans for the termination of employment for some 1750 employees are being studied.

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Dr. Emmett B. Carmichael, F.A.I.C., professor of biochemistry at the University of Alabama Medical Center, recently presented a valuable gift of 25,000 reprints of scientific articles to the Library of Howard College, Birmingham, Ala. The gift represents his 40-year collection on experimental medicine, more than half of which he had cross-indexed. The college is completing the catalog. The Library has made this an open end collection, and will welcome contributions from others.

Dr. V. L. Shipp, F.A.I.C., adjunct professor of chemical engineering, Polytechnic Institute of Brooklyn, N. Y., is starting a 2-semester course on Petrochemicals for graduate students in September. This course alternates with that on Petroleum Refining given during the past academic year.

Jack H. Dollinger, F.A.I.C., vice president-general manager of Ferro Chemical Corp., Bedford, Ohio, announces that the company has entered into a license agreement, for the manufacture of Ferro stabilizers for polyvinyl chloride resins in West Germany, with Chemische Werke Munchen Otto Barlocker G.m.b.H., Munich.

Dr. Robert H. King, F.A.I.C., is now employed as a civilian scientist at the U. S. Army Chemical Corps Proving Ground located at Dugway, Utah.

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Dr. Clarence Bremer, F.A.I.C., has been appointed technical director of Oakite Products, Inc., 19 Rector St., New York 6, N. Y.

Dr. Edmond C. Botti, F.A.I.C., of the Pigments Department of E. I. duPont de Nemours & Co., Wilmington 98, Del., recently presented "Cavalcade of Color" before the Paint Short Course for high school teachers, held at North Dakota State College. The course is sponsored by the Educational Committee, Federation of Paint & Varnish Production Clubs.

Dr. Robert Simha, F.A.I.C., as of September first, is visiting professor of chemistry for the academic year 1958-59, at the University of Southern California, Los Angeles 7, Calif.

ABOUT AIC MEMBERS

Sun Chemical Corporation has purchased Coating Materials Labs., of Nutley, N. J. **Dr. H. A. De Phillips**, F.A.I.C., president and general manager of Coating Materials Labs., and his entire staff, will continue in the same capacity under the new management.

Dr. Robert L. Stubbings, F.A.I.C., research associate professor of chemistry, Lehigh University, Bethlehem, Pa., received the Alsop Award of the American Leather Chemists Association, in June, for "making science and research a useful tool for the tanner."

Dr. John A. Southern, F.A.I.C., has left Howard College, Birmingham, Alabama, to be professor of chemistry and chairman of the Division of Science and Mathematics, at Furman University, Greenville, S. C.

Dr. Henry B. Hass, F.A.I.C., president of the Sugar Research Foundation, New York 5, N. Y., spent the month of August in Europe on a business trip.

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Dr. Eugene G. Rochow, F.A.I.C., professor of inorganic chemistry at Harvard University, will present the Annual Joseph J. Mattiello Memorial Lecture at the 36th Annual Meeting of the Federation of Paint & Varnish Production Clubs in the Cleveland Public Auditorium, Cleveland, Ohio, Oct. 5-8, 1958. The title of his lecture will be "In Pursuit of an Ideal."

William M. Lee, F.A.I.C., has been appointed by Pennsalt Chemicals Corp., Philadelphia 2, Pa., to be assistant to the vice president and technical director, **Dr. W. A. LaLande, Jr.**, F.A.I.C.

Dr. Kurt S. Konigsbacher, M.A.I.C., of Evans Research & Development Corp., New York 17, N. Y., visited various laboratories and industrial organizations in Europe during July.

Abraham A. Saffitz, M.A.I.C., announces the opening of offices at 337 Munsey Building, Washington 4, D. C., for handling chemical patent cases.

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William H. Tonkin, F.A.I.C., retired August first, after 35 years with Standard Brands Incorporated. He was technical director of the Frozen Products Division at Kansas City, Mo.

L. A. Rauch, F.A.I.C., vice president and general manager, Schaar & Company, Chicago 34, Ill., announces that new district office headquarters have been opened at Silver Spring, Maryland, in the Bryan Building.

Dr. Robert S. Aries, F.A.I.C., returned in July from the Achema Chemical Engineering Congress and Exhibition in Frankfurt, Germany, at which Aries Associates, Inc., 77 South St., Stamford Conn., exhibited.

Dr. Edward L. Haenisch, F.A.I.C., on leave as chairman of the Chemistry Department, Wabash College, Crawfordsville, Ind., has joined the staff of the National Science Foundation, Washington 25, D. C., as program director for Academic-Year Institutes, Division of Scientific Personnel and Education.

Dr. Henry Tauber, F.A.I.C., biochemist, U. S. Public Health Service, Chapel Hill, N. C., spent August in Europe. He presented a paper at the International Congress of Biochemistry in Vienna.

John J. O'Connell, F.A.I.C., vice president of marketing, Amoco Chemicals Corp., Chicago, Ill., announces a reduction in the price of phthalic anhydride.

Dr. Ray P. Dinsmore, Hon. AIC, was one of three research executives to serve on a panel of judges for the "Jobs for Tomorrow" contest, sponsored by Microbeads, Inc., of Toledo, Ohio, which was held this summer.

Mildred C. Hunt, F.A.I.C., is now literature researcher for the Sugar Research Foundation, 52 Wall St., New York, N. Y.

Dr. Earl L. Whitford, F.A.I.C., has been elected as a senior vice president of Hooker Chemical Corp., Niagara Falls, N. Y.

Elliott D. Fein, A.A.I.C., informs us that he is employed by the Trubek Laboratories, Inc., East Rutherford, N. J.

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